

XXXII.—Notes on various Species of the American Genus *Astylus*, Cast., with Descriptions of their Sexual Characters [*Coleoptera*]. By GEORGE CHARLES CHAMPION, F.Z.S.

CERTAIN species of the Malacoderm genus *Astylus*, Cast. (= *Mecoglossa*, Solier) exhibit remarkable sexual characters, two only of which appear to have been specially noticed by authors, viz., the broad, vertical lamella on each side of the terminal abdominal segment in ♂♂ of *A. trifasciatus* and *A. gayi*, mentioned by Guérin, and the deeply emarginate, bispinose apices of the elytra in ♀♀ of *A. octopustulatus* and *A. antillarum*, observed by Gorham. The presence of these and other important external structures, accompanied by peculiarities in the ♂ genital armature (visible in many dried specimens), has induced me to examine the tegmen and ædeagus (penis-sheath*) of nearly all the species represented in the British Museum, or in that of the Hope Collection at Oxford. These chitinous structures are noticed in detail in the present paper; and in a number of cases the insect itself, owing to uncertainties of identification, is re-described, or named, if new. The principal external characters observed, apart from the longer antennæ or curved tibiæ of the males of certain species, are:—(1) the presence of two compressed, subconical, tuberculiform or dentiform prominences on the metasternum in ♂ (*A. octopustulatus*, *gorhami*, &c.); (2) the long, spiniform, anterior trochanters in ♂ (*A. subgriseus*); (3) the obliquely produced or dentiform inner apical angles of one or more of the intermediate joints of the anterior tarsi in ♂ (*A. antis*, *splendidus*, *correptus*, and *convexus*); (4) the posteriorly constricted elytra in ♂ (*A. correptus*); (5) the deeply emarginate, bispinose apices of the elytra in ♀ (*A. octopustulatus*, *gorhami*, *antillarum*, &c.); (6) the sinuato-truncated apices of the elytra, with sharp or dentiform sutural angle, in ♀ (*A. quadrilineatus*, *imbricatus*, &c.); (7) the elongate, conical, terminal, abdominal segment in ♂ (*A. sexmaculatus*, &c.); (8) the laterally lamellate terminal abdominal segment, and broadly divided fifth ventral segment, in ♂ (*A. trifasciatus* and *gayi*); (9) the forcipate terminal dorsal segment in ♂ (*A. forcipatus*).

The tegmen of the ♂ in many of the species is very deeply emarginate or cleft at the apex (*A. trifasciatus*, &c.); in others it is feebly emarginate (*A. octopustulatus*, &c.), truncated (*A. cyanerythrus*, &c.), or simply rounded at the

* Median lobe of Sharp and Muir.

tip (*A. correptus*); the margins of the distal portion of this organ are usually clothed with long curled hairs. The very elongate penis-sheath exhibits a variety of forms: (1) almost straight from near the base and simply pointed at the tip (*A. antis* and many other species); (2) broad, compressed, and obliquely truncate at the tip (*A. sexmaculatus*); (3) constricted distally, and obliquely truncate and sub-securiform at the tip (*A. vittaticollis*); (4) flattened and strongly bisinuate as seen in profile (*A. trifasciatus* and *gayi*). The long membranous sac, containing the true intromittent organ, has not been examined: the distal portion of it is usually seen protruding from the dorsal surface of the penis-sheath at some distance before the apex of the latter, and in some cases the exposed part appears to be studded with asperities or short bristles*. The terminal abdominal segment of the ♂ is separated from the preceding segment, on both the ventral and dorsal aspects, by a membranous space, extending broadly forward along the entire length of the fifth ventral segment in *A. trifasciatus*, *sexmaculatus*, &c., allowing great freedom of movement of this portion of the body during copulation. In several species a thickened hook-like process has been noticed on the front of the first ventral segment in ♂; but as this structure is almost covered by the posterior coxæ, and cannot be seen till the abdomen is detached, no use has been made of it in the present paper.

The genus *Astylus* extends over the greater part of South America, and is particularly well represented at high elevations in the Ecuadorean Andes, two species occurring as far north as Panama, and two in the Lesser Antilles. The large Chilean forms have been placed under a separate genus, *Mecoglossa*, by Solier, a name that might conveniently be retained for them, on account of the extraordinary genital armature of the ♂, and the cleft terminal ventral segment of the ♀. Since the publication of the "Munich" Catalogue of Malacodermata, in 1869, numerous species of *Astylus* have been described or named by Kirsch, Berg, Steinheil, Gorham, Bourgeois, and Pic. It is questionable whether one of the papers by the last-named author, entitled "Sur le genre *Astylus*, Cast." (*L'Echange*, xvii. pp. 34-36, 1902), containing many proposed new names for S. American forms, unaccompanied by definite descriptions or measurements, and issued solely—as the author states—to secure priority, should

* The genitalia examined have been dissected by Mr. A. Cant. To extract these pieces without injury, it has been found necessary to boil the detached abdomen in caustic potash.

be recognized*. These hairy insects are found gregariously on flowers in open places, and they bear a certain relationship to the Palearctic *Henicopus*, wanting the peculiar structures in the legs of the males so conspicuous in nearly all the members of the last-named genus. The two species found in abundance by myself in Chiriqui in 1881-83 are still the only known representatives of *Astylus* recorded from north of the Isthmus of Panama.

The forms represented in the British Museum collection may be grouped by their structural characters or ♂ armature thus :†—

- a. Metasternum without tubercles or dentiform processes in ♂.
- a'. Wings fully developed.
- a². Terminal abdominal segment with broad vertical lamellæ in ♂, the segment itself transverse on the ventral aspect; sixth ventral segment divided in ♀; elytra more or less costate and rugosely punctured: ♂ with bilobed tegmen and strongly sinuate penis-sheath: species large, Chilean [MECOGLOSSA, Sol.] Nos. 1, 2.
- b². Terminal abdominal segment without lamellæ, conical or narrowed posteriorly in ♂; sixth ventral segment divided in ♀; elytra not costate: ♂ of *A. sexmaculatus* with bilobed tegmen and broad, obliquely truncate penis-sheath Nos. 3, 4.
- c². Terminal abdominal segment as in b²; sixth ventral segment not divided in ♀.
- a³. Elytra not constricted posteriorly in either sex, at most obsoletely costate.
- a⁴. Elytral apices rounded or obtuse in ♂ ♀, or (*A. vittatus*) obliquely truncate in ♀.
- a⁵. ♂ with bilobed or emarginate tegmen and acuminate penis-sheath, the intermediate joints of anterior tarsi angulate at inner apical angle in *A.antis* and *splendidius*.
- a⁶. Anterior trochanters simple in ♂ Nos. 5-22.
- b⁶. Anterior trochanters long and spiniform in ♂ No. 23.
- b⁵. ♂ with bluntly rounded or truncated tegmen and acuminate penis-sheath Nos. 24, 25.
- c⁵. ♂ with bilobed tegmen and apically dilated penis-sheath No. 26.

* This article is catalogued in the 'Zoological Record' for 1902, p. 140, as "Notes on proposed n. spp.;" but the paper itself is not analysed, and the new names are not given.

† Males of *A. hæmatostictus*, *sexpustulatus*, *convexus*, and *amabilis* not dissected, those of *A. pallipes*, *imbricatus*, and *laticauda*, and female of *A. forcipatus* wanting.

- b*⁴. Elytral apices sinuato-truncate and sutural angles sharp in ♂ ♀* : ♂ with emarginate tegmen and acuminate penis-sheath No. 27.
- a*³. Elytra constricted posteriorly in ♂, subparallel in ♀, sharply costate laterally in both sexes : ♂ with joints 2 and 3 of anterior tarsi produced at inner apical angle, the tegmen rounded at tip, and the penis-sheath acuminate No. 28.
- d*². Terminal abdominal segment with a long process on each side in ♂, the tegmen truncate, and the penis-sheath acuminate; elytra bicostate, the inner costa prominent. No. 29.
- b*¹. Wings wanting or rudimentary; elytra not costate: ♂ with joints 2 and 3 of anterior tarsi produced at inner apical angle No. 30.
- b*. Metasternum bituberculate or bidentate in ♂; elytra uni- or bicostate; wings fully developed: ♂ with tegmen truncate or feebly emarginate and penis-sheath acuminate.
- c*¹. Elytral apices rounded or truncate in ♂, bispinose and deeply emarginate in ♀ Nos. 31-36.
- d*¹. Elytral apices rounded or subtruncate in ♂, sinuato-truncate, and with the sutural angles sharp and overlapping, in ♀ Nos. 37-39.

1. *Astylus trifasciatus*.

Dasytes (Astylus) trifasciatus, Guér. Icon. Règne Anim. p. 48, t. 15. figs. 2-2 c; Redt. Reise Novara, ii. p. 109.

Mecoglossa rugosa, Solier, in Gay's Hist. Chile, iv. p. 426, t. 10. figs. 5-5 g.

♂. Ventral sutures 1-4 oblique from the outer margin to median line; segment 1 with a stout hook in the middle at the base; segment 5 long, divided into two, widely separated, apically convergent lobes, which are broadly subtruncate at the tip, the median portion membranous. Terminal segment elongate on the dorsal aspect, transverse on the ventral aspect, angulate on each side towards the apex beneath, the apical portion dilated laterally into a broad, vertical, inwardly concave, securiform lobe, and the apical margin toothed in the centre above. Tegmen with moderately long, ciliate, feebly curved, lateral lobes, which are subtruncate or bluntly rounded at the tip. Penis-sheath very strongly, bisinuate curved, tapering at the tip.

♀. Ventral segment 6 about as long as 5, cleft, and separated laterally from the dorsal portion.

Hab. CHILE.

Apparently a common species in some parts of Chile.

* Possibly a variable character in this species, *A. quadrilineatus*.

This insect has extremely rugosely punctured elytra, and two more or less distinct costæ on the disc; the first and second fasciæ are usually connected with the dark sutural stripe, and the latter is sometimes dilated at the tip. The females are broader than the males, and some of them (labelled with the MS. name *Mecoglossa intermedia* in the Fry collection), from Lota, Chillan, &c., have much less coarsely punctate elytra. The long hairs on the under surface are cinereous in colour in the rugose form, and intermixed with black hairs in the smoother examples. The elytral markings are sometimes reduced to two spots on the outer part of the disc, the anterior one being quite small. Females largely preponderate in the long series before me, few of which are labelled with any definite locality.

2. *Astylus gayi*.

Dasytes (Astylus) gayii, Guér. Icon. Règne Anim. p. 48.

Mecoglossa affinis, Solier, in Gay's Hist. Chile, iv. p. 427.

Dasytes porrectus, Buquet, in Dej. Cat. 3rd edit. p. 123 (1837).

Hab. CHILE, Valparaiso (*C. Darwin*), Concepcion, San Blas, Coquimbo (*Mus. Brit.*), Araucania (*R. M. Middleton*), &c.

This insect is a smoother, very hairy form of *A. trifasciatus*, with the elytral markings usually reduced to three angular patches along the outer part of the disc and the sutural stripe dilated at the base and apex, and the long hairs on the under surface entirely or in great part black. The two forms have precisely similar ♂ armature, and the smoother females alluded to under *A. trifasciatus* would be equally well placed under either of them.

3. *Astylus sexmaculatus*.

Dasytes sexmaculatus, Perty, Del. Anim. art. Bras. p. 29, t. 6. fig. 15; Blanch. in Voyage d'Orbiguy, vi. 2, p. 96.

Dasytes pictus, Dej. Cat. 3rd edit. p. 123 (1837).

♂. Ventral segment 1 with a blunt hook in the centre at the base; 5 broadly cleft down the middle, the lateral portions subtruncate at the tip. Terminal segment long, tubulate, narrowing outwards, emarginate laterally at the apex. Tegmen with long, spoon-shaped, slightly sinuous lateral lobes, which are curved inwards at the tip, and thickly fringed with long hairs. Penis-sheath stout, compressed, the outer portion broadly, obliquely truncate, as seen in profile.

♀. Ventral segment 5 short, triangular, emarginate, 6 cleft, shorter than 5.

Hab. BRAZIL, Rio de Janeiro (*Blanchard, Fry*), São Paulo (*Perty*), Alto de Serra Paulo (*G. E. Bryant*).

A long series seen, males preponderating, showing scarcely any variation, except in size. The penis-sheath of the ♂, examined in many specimens, is very different from that of any of the allied species dissected.

4. *Astylus hæmatostictus*, sp. n.

Elongate, narrow, shining, nigro-pilose above and beneath; nigro-cæruleous, the head and prothorax greenish, the elytra with an oblong spot at the base, the lateral margins to near the middle, a triangular postmedian patch on the disc, and a transverse subapical mark, luteous or reddish, the antennæ testaceous to about the middle; the head and prothorax finely, the elytra rather coarsely punctate. Head not much developed behind the eyes; antennæ moderately long in ♂, short in ♀. Prothorax transverse, rounded at the sides in both sexes. Elytra long, subparallel in their basal half.

♂. Ventral segment 5 broadly arcuato-emarginate, 6 moderately long, conical, cleft down the middle.

♀. Ventral segment 6 short, divided down the middle.

Length 6-6½, breadth 2½-2¾ mm. (♂ ♀.)

Hab. BRAZIL, Minas Geraes (*Mus. Brit.*).

Described from a pair acquired by the Museum in 1844, the ♂ labelled with the MS. specific name *hæmatostictus*. An elongate, narrow, metallic insect, with nigro-cæruleous elytra, which are each marked with three rather large luteous or reddish spots—one basal (oblong), one postmedian (triangular), and one subapical (transverse). A larger abraded ♀ (length 8¼ mm.), from Puarcatambo, Peru, too imperfect to name, differs from the Brazilian insect in having the elytra less coarsely punctate, and the three spots transverse, the second forming a definite arcuate fascia. *A. hæmatostictus* seems to be nearest allied to *A. sexmaculatus*, Perty, from which it is separable by its smaller size, narrower form, and the differently shaped spots on the elytra. The unique male has not been dissected.

5. *Astylus antis*.

Dasytes antis, Perty, Del. Anim. art. Bras. p. 29, t. 6. fig. 13 (1833);
Cast. Hist. Nat. Coleopt. i. p. 280.

Dasytes flavofuscatus, Blanch. in Voyage d'Orbigny, vi. 2, p. 97, t. 6. fig. 10.

Astylus fasciatus [Germ. in Dej. Cat. 3rd edit. p. 123], Sharp and Muir, Trans. Ent. Soc. Lond. 1912, pp. 540, 541 (♂ genit. armature).

♂. Anterior tarsi with joints 3 and 4 angulate, and 2 obliquely dentate, at the inner apical angle. Ventral segment 5 broadly, deeply emarginate. Terminal segment long, tubulate, narrowing from the base, cleft beneath. Tegmen narrowly cleft for a short distance at the apex, which is fringed with long hairs. Penis-sheath narrowed and somewhat acuminate at the tip.

♀. Ventral segment 6 short, undivided, feebly notched at the apex.

Hab. BRAZIL, Rio de Janeiro, Santa Catharina, São Paulo, Rio Grande, &c.; PARAGUAY, Sapucay (*W. Foster*); ARGENTINA, Corrientes (*sec. Blanchard*).

Of the twenty-five specimens before me, females preponderating, five belong to the smaller form with a relatively narrow prothorax in both sexes, this latter corresponding to the *D. flavofasciatus* of Blanchard, from Corrientes, Rio Grande, Sapucay, &c. A male of each has been dissected, and the armature proves to be precisely similar. The broad, complete, submedian flavous fascia on the elytra separates *A. antis* from *A. splendidus*. The prothorax and the base of the elytra are thickly set with long, erect or projecting, black hairs in both of them. The length varies from 10-16 mm.

6. *Astylus splendidus*.

Dasytes splendidus, Cast. Ann. Soc. Ent. Fr. 1832, p. 398; Hist. Nat. Coleopt. i. p. 280.

Hab. BRAZIL (*Mus. Uvon.*), Rio de Janeiro (*Fry*).

This is a large very brilliantly coloured form of *A. antis* with the flavous markings on the elytra reduced to an oblique subapical fascia on the outer part of the disc; the fascia, however in one of the five examples seen (2 ♂♂, 3 ♀♀) reaches the suture and is continued along it for a short distance forward. The ♂ characters are similar to those of *A. antis*, and the two insects are certainly nothing more than forms of one species. Both occur at Rio de Janeiro, where also the smaller and narrower *A. flavofasciatus*, Blanch., has been found.

7. *Astylus aulicus*.

Astylus aulicus, Dej. Cat. 3rd edit. p. 123 (1837); Pic, Bull. Soc. Ent. Fr. 1908, pp. 328, 329.

♂. Ventral segment 5 broadly, semicircularly emarginate 6 about as long as 5, undivided, with a narrow, deep, triangular

notch at the apex. Tegmen with two long, widely separated, straight lateral lobes, which are fringed with long hairs at the tip. Penis-sheath stout, acuminate and slightly up-turned at the apex.

♀. Ventral segment shorter than 5, simple.

Hab. COLOMBIA; VENEZUELA.

A common insect in the countries quoted. The typical form has a transverse, angulate red patch on the outer part of the elytra before the middle, sometimes (var. *fenestratus*, Pic, l. c.) extending forward along the outer margin and up the middle of the disc to the base. Examples also occur with a small red spot at the base and one or two others beyond the middle. The ♂-characters are described from three specimens dissected many years ago by Dr. Sharp.

8. *Astylus rubripennis*.

Dasytes rubripennis, Latr. in Voyage Humboldt, i. p. 178, t. 17. fig. 3.
Melytris (Astylus) rubripennis, Er. in Wieg. Archiv für Naturg. xiii. 1, p. 84.

♂. Ventral segment 5 broadly arcuato-emarginate, 6 with an oblong excavation in the centre at the apex, and the apex itself deeply emarginate. Tegmen with short, broad lateral lobes, the apices of which are obliquely truncate and thickly set with long hairs. Penis-sheath stout, gradually narrowed and slightly curved at the tip.

Hab. ? COLOMBIA (*Mus. Brit.*); PERU, Jacq. de Bracamorras (*Humboldt and Bonpland*).

Two males in the Museum labelled "Colombia" and acquired in 1844, agree with Latreille's figure of *D. rubripennis* and Erichson's subsequent description of the same species. The elytra have the reddish portion of the surface more extended than in *A. bonplandi*, leaving a broad, posteriorly angulate space at the base (enclosing an oval or oblong reddish patch), a small spot on the disc towards the apex, and the sutural and apical margins black. The very different ♂-armature shows that the two insects are distinct.

9. *Astylus bonplandi*.

Melytris (Astylus) bonplandi, Er. in Wieg. Archiv für Naturg. xiii. 1, p. 84 (1847).

Dasytes rubripennis, var., Latr. in Voy. Humboldt, i. p. 178, t. 17. fig. 4.

Astylus bonplandi, Bourg. Bull. Mus. Paris, 1911, p. 212.

♂. Ventral segment 5 broadly arcuato-emarginate, 6 un-

divided, with a small, deep, triangular notch at the tip. Tegmen with rather broad, long, lateral lobes, which are angularly dilated at the apex within, the apices clothed with black hairs. Penis-sheath almost straight from near the base, abruptly narrowed at the tip, the narrow apical portion slightly thickened distally.

♀. Ventral segment 6 simple, about as long as 5.

Hab. ECUADOR (*Buckley*), Chillalocha, Loja (*Bourgeois*), San Lucas, Quito (*ex coll. Fry*), ? Guayaquil (*Rosenberg*); PERU, Jaen de Bracamorras (*Humboldt and Bonpland*), Moyabamba (*ex coll. Fry*), Nauta; BOLIVIA.

To judge from the labels on the numerous examples before me, two or more species are confused in collections under the name *A. bonplandi*, after the elimination of *A. rubripennis*; and it is doubtful if much reliance can be placed on some of the Ecuador locality tickets, as it is scarcely likely that an insect ranges from the sea-level at Guayaquil to the elevated region of Quito. A moderately large, black, thickly nigro-pilose * form; the elytra red, with a common scutellar patch, an oblong patch at the shoulder (these markings sometimes coalescent posteriorly), two transversely-placed spots at the middle of the disc (often confluent and reaching the suture), a large spot below them, the sutural and apical margins, and the outer margin in part, black. In one or two examples the upper surface has a faint metallic tinge.

10. *Astylus cæruleotinctus*, sp. n.

Moderately elongate, shining, nigro-pilose; nigro-cæruleous, sometimes with a greenish lustre, the basal joints of the antennæ rufo-maculate; the elytra with an oval, posteriorly acuminate spot at the base, two transversely-placed patches before the middle (the inner one subtriangular or oval, and sometimes coalescent with the basal spot, the outer one extending forward along the outer margin to the shoulder), and a large, anteriorly subtruncate, complete or incomplete annulus before the apex, flavescent or red. Head small, somewhat deeply inserted into the prothorax, closely, finely punctate, hollowed in the middle between the eyes, the latter not very prominent; antennæ moderately long in ♂, shorter in ♀. Prothorax transverse, finely punctured, the margins strongly reflexed. Elytra rather broad, rounded at the apex, closely, somewhat coarsely punctate, sometimes with a faint costa on the inner part of the disc. Legs slender.

* Several examples in the Fry collection are completely abraded above.

♂. Ventral segment 5 deeply arcuato-emarginate, 6 conical, cleft down the middle to near the apex, leaving a narrow membranous space exposed. Tegmen with long, narrowly separated lateral lobes, which are somewhat spoon-shaped and flavo-ciliate at the tip. Penis-sheath rather slender, the outer portion straight, narrowly produced at the apex, the latter rounded.

♀. Ventral segment 6 short, simple.

Length 8-11, breadth 4-5 mm. (♂ ♀.)

Hab. COLOMBIA, Bogota; VENEZUELA; PERU.

Fifteen examples, including five males. A less robust, smaller insect than *A. bonplandi*, the surface constantly metallic, the elytral markings somewhat different, the sub-apical annulus always well defined, the legs more slender; the ♂ with the sixth ventral segment almost divided down the middle, and the lateral lobes of the tegmen undilated at the tip. Some of the specimens seen, both in the British Museum and in the Hope Collection at Oxford, are ticketed *A. (Dasytus) bonplandi* or *A. rubripennis*, Latr.; the three at Oxford are without locality-label.

11. *Astylus nigrolimbatus*, sp. n.

Moderately elongate, somewhat robust, shining, nigropilose; nigro-ceruleous, the basal joints of the antennæ rufo-maculate; the elytra with a space at the base (enclosing a transverse reddish spot), the suture thence to the tip, a triangular or transverse patch at about the middle of the disc (reaching the suture in one specimen), a rounded or sub-triangular patch below this, a patch at the apex, and the outer margin entirely of the ground-colour, the rest of their surface orange-yellow. Head, antennæ, and prothorax much as in *A. ceruleotinctus*, and the elytra similarly sculptured.

♂. Ventral segment 1 hooked in the centre in front, 5 deeply, semicircularly emarginate, 6 long, conical, with an elongate-triangular notch at the tip, without trace of median division. Tegmen with long, flattened lateral lobes, which are rounded and flavo-ciliate at the apex. Penis-sheath almost straight, somewhat abruptly narrowed at the apex, the protruding membranous sac studded with minute points.

♀. Ventral segment 6 short, simple.

Length $7\frac{1}{2}$ - $9\frac{1}{2}$, breadth $3\frac{1}{2}$ - $4\frac{1}{2}$ mm. (♂ ♀.)

Hab. ECUADOR (*ex coll. Fry*: ♀); PERU [*type*] (*ex coll. Fry*: ♂ ♀).

Three males and two females. This insect resembles the smaller examples of *A. bonplandi*, from which it is separable

by the transverse reddish basal spot and the entirely bluish-black outer margin of the elytra. The ♂ has a similarly undivided sixth ventral segment; but the lateral lobes of the tegmen are shaped much as in the same sex of *A. ceruleotinctus*, which has an incompletely cleft sixth ventral segment in ♂. The above-mentioned colour differences also distinguish *A. nigrolimbatus* from the last-named insect, the outer limb of the elytra being partly flavescent or red in all the specimens of *A. bonplandi* and *A. ceruleotinctus* before me.

12. *Astylus bourgeoisi*.

Astylus bourgeoisi, Kirsch, Abhandl. Zool. Mus. Dresden, 1888-89, no. 4, p. 11, t. 1, fig. 20; Bourg. Bull. Mus. Paris, 1911, p. 212.

Astylus bissexguttatus, Gorh. in Whymper's Great Andes, Suppl. App. pp. 52, 53, fig. (1891).

♂. Ventral segment 5 broadly arcuato-emarginate, 6 subtriangular, sulcate down the middle, notched at the tip. Tegmen narrow, with long, compressed, subcontiguous lateral lobes, which are ciliate and somewhat rounded at the tip. Penis-sheath with the outer portion almost straight, sulcate on the ventral aspect, abruptly narrowed at the apex.

♀. Ventral segment 6 short, simple.

Hab. COLOMBIA (*ex coll. Sharp*), Tuquerres (*sec. Kirsch*); ECUADOR, Quito, Cayambe, Mindo, Machachi, &c.

This variable insect is common at high elevations (8000-10,000 ft.) in Ecuador, many localities being given for it by Bourgeois and Gorham, who figure similar well-marked examples. The latter have on each elytron a patch at the base, two transversely placed, oblong spots towards the middle, and a large annulus before the apex, flavescent or red, these markings being sometimes reduced to small spots, three of which represent the broken-up annulus. The inner submedian juxta-sutural spot is rarely wanting, and the elytra themselves are coarsely punctured. Two dissimilarly coloured males have been dissected, showing no variation in the armature.

13. *Astylus riveti*.

Astylus riveti, Bourg. Bull. Mus. Paris, 1911, p. 213.

Moderately elongate, shining, pilose, the hairs on the upper surface mostly black, with shorter decumbent greyish hairs intermixed, those on the under surface and legs cinereous; æneous, the basal joints of the antennæ entirely or in part, and the others at the extreme base, rufous; the

elytra greenish, nigro-cæruleous, or black, with an elongate streak at the middle of the base, two or three shorter streaks (including one near the outer margin) below this, and a large irregular annulus before the apex, all sometimes coalescent or partly obsolete, flavescens or rufo-testaceous; the head, prothorax, and scutellum closely, finely punctate, the elytra foveolato-punctate, with minute punctures in the narrow interspaces. Head small, the anterior portion short; antennæ moderately long in ♂, shorter in ♀. Prothorax transverse, rounded at the sides in both sexes. Elytra subparallel to about the middle, the humeri tumid, the apical margin finely crenulate.

♂. Ventral segment 5 broadly arcuato-emarginate, 6 about as long as the lateral portions of 5, without groove, deeply, triangularly notched at the tip. Tegmen with long, compressed, narrowly separated, lateral lobes, which are rounded and flavo-ciliate at the apex. Penis-sheath pointed at the tip.

Length 6-7, breadth $2\frac{3}{5}$ - $3\frac{1}{2}$ mm. (♂ ♀).

Hab. ECUADOR, Tioloma, alt. 4263 metres (*sec. Bourgeois*: type), Cañar (*Rosenberg ex coll. Fry*: ♂ ♀).

The above description is taken from four males and one female from Cañar, which vary greatly in the development of the elytral markings. *A. riveti*, Bourg., from Tioloma, based on a single example (♀?), seems to belong to the same species. The elytra in the insect before me are more coarsely punctured than in the allied *A. bourgeoisi*, Kirsch (= *bissex-guttatus*, Gorb.), a common species in the Andes of Ecuador, and equally variable in colour. In one example (♂) of the present insect the markings are entirely wanting on the basal half of the elytra, and in another (♀) the elytra (as in the type of *A. riveti*) are rufo-testaceous, with the sutural and outer margins, and four irregular angular patches black.

14. *Astylus sexpustulatus*, sp. n.

Moderately elongate, shining, the elytra duller, sparsely nigro-pilose; nigro-æneous, the basal joints of the antennæ partly red, the elytra black, each with six sharply defined orange-yellow spots—one, transverse, rather large, at the base, one small, beneath the humeral callus (not visible from above), one oblong, subquadrate, lateral, at about the basal third, one, small, oval, near the suture, before the middle, one, oblique, on the outer part of the disc, beyond the middle, and one, rather large, triangular, near the apex; the head and prothorax closely, finely, the elytra very coarsely, punctured.

Head rather small; antennæ short in both sexes. Prothorax transverse, rounded at the sides. Elytra moderately long, without costæ; the apices, ♂ ♀, rather narrow, rounded, feebly denticulate.

♂. Ventral segment 5 deeply arcuato-emarginate, 6 subconical, moderately long.

Length $5\frac{1}{3}$ -6, breadth $2\frac{1}{5}$ - $2\frac{1}{3}$ mm. (♂ ♀.)

Hab. ECUADOR (*Rosenberg*).

One pair. Smaller than *A. bourgeoisii*, Kirsch (= *bissæ-guttatus*, Gorb.), the head narrower, the antennæ much shorter, the elytral markings very different, the six orange-yellow spots (one of which is not visible from above) precisely similar in the two specimens seen. The male, not dissected, doubtless has a bilobed tegmen.

15. *Astylus sexguttatus*.

Astylus sexguttatus, Kirsch, Abhandl. Zool. Mus. Dresden, 1888-89, no. 4, p. 11, t. 1, fig. 20.

♂. Ventral segment 5 broadly, semicircularly emarginate, 6 grooved down the middle. Tegmen with long, narrowly separated, rather broad lobes, which are ciliate at the tip. Penis-sheath attenuate, the apical portion beyond the aperture narrow.

Hab. COLOMBIA, Popayan and Jambalo (*sec. Kirsch*).

There is a ♂ of this species in the Museum received in 1855, labelled with the MS. name *A. bimaculatus*, Cht., and as from Guatemala, the locality being certainly incorrect. A brilliant, nigro-cæruleous insect, with six sharply defined flavous spots on each elytron, arranged 1, 2, 2, 1. *A. michaelisi*, Pic (1908), from Theresopolis, Brazil, seems to be more nearly allied to *A. sexguttatus* than to *A. sexmaculatus*, Perty, with which it is compared by its describer.

16. *Astylus luteoguttatus*, sp. n.

Moderately elongate, narrow and subparallel-sided (♂), or broader (♀), shining, pilose, the hairs on the under surface and legs cinereous; greenish-æneous, the elytra and ventral surface often nigro-cæruleous, the latter with a spot at the base, two others along the sides (the anterior one sometimes obsolete), another, transverse, before the apex, and sometimes two additional spots along the disc near the suture orange-yellow or rufous, the basal joints of the antennæ rufo-maculate; sparsely, finely, the elytra moderately coarsely punctate. Head rather narrow, well developed behind the

eyes; antennæ moderately long in ♂, shorter in ♀. Prothorax transverse, rounded at the sides in ♂, narrowed anteriorly in ♀. Elytra moderately long, the apices somewhat produced.

♂. Ventral segment 5 broadly arcuato-emarginate, 6 subconical. Tegmen with long, somewhat spoon-shaped, lateral lobes, their apices flavo-ciliate. Penis-sheath almost straight, subacuminate at apex.

Length 6-7, breadth $2\frac{2}{5}$ - $3\frac{1}{4}$ mm. (♂ ♀.)

Hab. ECUADOR, Loja (*Rosenberg*), Macas (*Buckley*); PERU (*ex colls. Murray and Fry*: type).

Fifteen examples, ten of which are from Peru, females preponderating, three out of the four from Loja having two additional reddish spots on the disc of the elytra near the suture. Recognizable by the metallic green or bluish elytra, with sharply-defined orange spots, the two near the suture evanescent, and the two submarginal ones often very small or wanting. *A. luteoguttatus* is allied to the Colombian *A. sexguttatus*, Kirsch, differing from the latter in its much smaller size, less robust build, shorter elytra, &c. *A. latemaculatus*, Pic, from Peru, seems to be the nearest ally amongst those indicated by him in 1902.

17. *Astylus luteicauda*, sp. n.

Moderately elongate, shining, pilose; nigro-æneous, greenish or æneous, the antennæ wholly or in part, the apices of the elytra, the tibiæ (except at the base), and tarsi testaceous or rufo-testaceous; the head and prothorax rather sparsely, the elytra very coarsely, punctate. Head elongated behind the eyes, and depressed in the middle between them, narrow in ♀, broader in ♂; antennæ long and rather slender in ♂, short in ♀. Prothorax transverse, broad and with the sides rounded in ♂, rapidly narrowed from near the base in ♀. Elytra subparallel, sometimes with an indication of a faint costa on the disc, the apical margin obsolete crenulate.

♂. Ventral segment 5 broadly arcuato-emarginate, 6 conical, notched at the tip. Tegmen with long, compressed lateral lobes, which are rounded and flavo-ciliate at the tip. Penis-sheath straight, pointed at the apex.

Length 5-6, breadth $2\frac{2}{5}$ - $2\frac{4}{5}$ mm. (♂ ♀.)

Hab. ECUADOR, Loja and Zaragura (*Rosenberg ex coll. Fry*).

Three females and two males. This insect must be nearly

related to, and perhaps a form of, the Peruvian *A. nigro-femoralis*, Pic^{*}, which is said to have the elytra luteo-trilineate at the base and luteo-maculate at the apex. The last-named species is compared by him with *A. pallipes*, Kirsch, from Ecuador. The longer head (especially in ♀), rufo-testaceous tibiae and tarsi, less coarsely punctured elytra, &c., separate *A. luteicauda* from *A. riveti*, Bourg. in all its varieties. The ♂-armature is very similar in the two forms. *A. (Dasytes) xanthurus*, Blanch., from Maldonado, also has a yellowish tip to the elytra.

18. *Astylus variegatus*.

Dasytes variegatus, Germ. Ins. Spec. nov. p. 77 (1824); Cast. Hist. Nat. Col. i. p. 280²; Blanch. in Voyage d'Orbigny, p. 97³.

Astylus variegatus, Redt. Reise Novara, ii. p. 109⁴.

Astylus variegatus, Germ., var. *notatus*, Pic, L'Echange, xvii. p. 36 (1902)⁵.

? *Astylus atromaculatus*, Blanch., var. *revoili*, Pic, L'Echange, xvii. pp. 35, 36 (1902)⁶.

Var. Larger, the head and prothorax black, the elytra reddish, with the black median patch curving downwards posteriorly and coalescent with the sutural stripe; all the tibiae more or less curved in ♂.

♂. Anterior and intermediate tibiae curved. Ventral segment 5 broadly arcuato-emarginate, 6 conical, undivided, deeply, triangularly notched at tip. Tegmen with very long, somewhat spoon-shaped lateral lobes, which are flavo-ciliate along their lower margin and at the apex. Penis-sheath stout, acuminate at apex.

♀. Ventral segment 5 feebly emarginate, 6 transverse.

Hab. BRAZIL^{1 2 4 5}, Rio de Janeiro^{3 6}, Minas Geraes, Pernambuco, São Paulo, Rio Grande; PARAGUAY, Sapucaý (*W. Foster*); ARGENTINA, Corrientes³.

Apparently an abundant insect in many parts of Brazil, especially about Rio de Janeiro, and often found gregariously on flowers. The larger and darker form (? *revoili*, Pic) has the lateral lobes of the ♂-tegmen rounded at the tip (not incurved and truncate as in *A. atromaculatus*), and shaped as in *A. variegatus*. The head and prothorax are usually metallic in the latter. The subapical spot on the elytra is sometimes obsolete, sometimes (var. *notatus*) united with the one on the opposite elytron into a common transverse patch.

* Mélanges exot.-entom. xii. p. 8 (Jan. 1915).

19. *Astylus atromaculatus*.

Dasytes atromaculatus, Blanch. in Voyage d'Orbigny, p. 97, t. 6. fig. 10.

Astylus atromaculatus, Blanch., var. *12-maculatus*, Pic, L'Echange, xvii. p. 36 (1902).

♂. Anterior and intermediate tibiæ curved. Ventral segment 5 broadly arcuato-emarginate, 6 about as broad as long, deeply, triangularly notched at tip. Tegmen with long, broad lateral lobes, which are incurved at the apex within, subtruncate or blunt at the tip, and flavo-ciliate along their lower and apical margins. Penis-sheath stout, acuminate at apex.

♀. Ventral segment 5 feebly emarginate, 6 transverse.

Hab. ARGENTINA (*O. W. Thomas*), Mendoza, Catamarca (*Mus. Brit.*), Tucuman (*ex coll. Sharp*); BOLIVIA (*Mus. Oxon.*).

A close ally of *A. variegatus*, but differing from it in having the prothorax densely clothed with adpressed cinereous hairs (in addition to the long, erect, bristly, black hairs) at the sides and down the middle, the cinereous pubescence extending over the greater part of the dorsum in the Tucuman examples; the median and postmedian black patches on the disc of each elytron oblique and less rounded, the median patch more or less constricted at the middle and sometimes divided into two spots (the six spots being arranged 2, 2, 1, 1 = var. *12-maculatus*, Pic); the tegmen of ♂ with incurved more or less truncate lateral lobes. Living examples of this insect have been captured at Durban and Pretoria, doubtless introduced with hay during the Boer War. Blanchard gave no locality* for *A. atromaculatus*, but states that d'Orbigny found it in profusion on flowering lianas on the borders of woods. The Bolivian example in the Oxford Museum is labelled "*nigricollis* Hope."

20. *Astylus lineatus*.

Anobium lineatum, Fabr. Syst. Ent. p. 62¹.

Melyris lineatus, Oliv. Ent. ii. 21, t. 1. fig. 6².

Dasytes lineatus, Cast. Hist. Nat. Col. i. p. 281³; Blanch. in Voyage d'Orbigny, p. 98⁴.

Astylus lineatus, Redt. Reise Novara, ii. p. 109⁵.

♂. Anterior and intermediate tibiæ feebly curved. Ventral segment 5 deeply arcuato-emarginate, 6 conical, broader

* The "Munich" Catalogue incorrectly gives Brazil.

than long, truncate at the tip. Tegmen with very long, rather narrow, lateral lobes, which are slightly incurved and rounded at the apex, their lower and apical margins flavo-ciliate. Penis-sheath drawn out into a rather long slender point, which is thickened at the tip.

Hab. BRAZIL¹³, Rio Janeiro⁵ (*d'Orbigny*⁴, *C. Darwin, Fry, &c.*).

A common insect in Brazil. The long series examined shows scarcely any variation in the peculiar elytral markings. The type in the Banksian collection is a male.

21. *Astylus vittatus*.

Astylus vittatus, Gorh. Biol. Centr.-Am., Coleopt. iii. 1, pp. 127, 330, t. 7, fig. 9 (excl. example from Venezuela).

Astylus vittatus, Gorh., var. *chiriquensis*, Pic, Mélanges exot.-entom. xii. p. 7 (Jan. 1915).

♂. Elytra rounded at the apex. Ventral segment 5 deeply arcuato-emarginate, 6 moderately long, subconical, smooth, grooved down the middle posteriorly, and feebly notched at the tip. Tegmen bifurcate at apex, excavate at the tip above, the apical portion clothed with long, curled, blackish hairs. Penis-sheath acuminate at tip.

♀. Elytra obliquely subtruncate at the apex.

Hab. PANAMA, Chiriqui.

Found in abundance in Chiriqui. The variety has the flavous or reddish stripes (juxta-sutural and discal) on the elytra coalescent anteriorly, and the inner costa well defined. The metasternum is without tubercles in ♂. The sexes were not identified by Gorham. The unarmed apices of the elytra in ♀ separate *A. vittatus* from various similarly coloured forms.

22. *Astylus pallipes*.

Astylus pallipes, Kirsch, Abhandl. Zool. Mus. Dresden, 1888-89, no. 4, p. 11, t. 7, fig. 22.

Hab. ECUADOR, Quito (*ex coll. Murray*), Loma de Canamballo [type].

A female example from Quito, in the Museum, from the Fry collection, is evidently referable to this species. It is black, with the antennæ in great part, the tibiæ (except at the base), and tarsi testaceous; the elytra flavescens, with the suture, outer margin, two lines on the disc, and the tip black, the surface very coarsely punctured.

Ann. & Mag. N. Hist. Ser. 9. Vol. ii.

26

23. *Astylus subgriseus*.

Astylus subgriseus, Pic, L'Echange, xvii. p. 35 (1902).

♂. Moderately elongate, shining, thickly clothed with rather long, adpressed, cinereous pubescence intermixed on the upper surface with long, erect, black, bristly hairs; nigro-aneous or nigro-cæruleous, the basal joints of the antennæ partly red, the elytra with three narrow luteous stripes—one near the suture and extending along it at the tip, one running down the disc to the middle, and narrowing from the base, and one marginal, complete; the head and prothorax closely, very finely punctate, with coarser punctures intermixed, the elytra roughly punctured. Head well developed behind the eyes; antennæ moderately long. Prothorax a little broader than long, strongly rounded at the sides, and much narrowed behind. Elytra moderately elongate, subparallel, somewhat abruptly and obliquely narrowed at the tip, the apices narrow, the sutural angles sharp. Legs long; anterior and intermediate tibiæ curved; anterior trochanters drawn out into a long, blunt, spiniform process, which is finely denticulate beneath. Ventral segment 5 deeply arcuato-emarginate, 6 elongate, subconical. Tegmen with very long lateral lobes, which are subtruncate, slightly incurved, and flavo-ciliate at the tip. Penis-sheath abruptly acuminate at apex.

Length $6\frac{2}{5}$ –7, breadth $2\frac{1}{2}$ –3 mm.

Hab. BRAZIL [type], Pernambuco (*Gounelle*).

Two males, each with the genital armature protruding. They are provisionally referred to the imperfectly described *A. subgriseus*, Pic, from Brazil, which is said to have three yellowish vittæ on the elytra, the one on the disc not reaching beyond the middle, and the suture black. It is the only species of the genus known to me with a long spiniform process extending outward from the anterior trochanters in ♂.

24. *Astylus cyanerythrus*.

Dasytes cyanerythrus, Perty, Del. Anim. artic. Bras. p. 29, t. 6. fig. 14¹.

Dasytes bifasciatus, Cast. Hist. Nat. Col. i. p. 280².

Dasytes rubrofasciatus, Blanch. in Voyage d'Orbigny, p. 97³.

♂. Ventral segment 5 broadly arcuato-emarginate, 6 about as long as broad, membranous in the middle at the base, triangularly notched at the apex. Tegmen broad, the outer portion comparatively short, bluntly rounded, unemarginate,

and fringed with long hairs at the tip. Penis-sheath stout, abruptly acuminate and hooked at the apex.

♀. Ventral segment 6 short, simple.

Hab. BRAZIL^{1,2}, Rio de Janeiro³, Santa Catharina, Bahia.

The seventeen examples of *A. cyanerythrus* before me (13 ♀ ♀, 4 ♂ ♂), belonging to the British Museum, or to the Hope Collection at Oxford, vary greatly in size (length $4\frac{1}{2}$ –10, breadth $2\frac{1}{2}$ – $5\frac{1}{2}$ mm.), and to some extent in colour. The two black patches on the disc of the prothorax are often transversely confluent, and the dark coloration sometimes extends over the whole dorsum, or leaves the basal margin only red; and the reddish submedian and subapical fasciæ on the elytra are very narrow in some examples, and not connected along the suture, differing in this respect from Perty's figure. Three of the specimens at Oxford are labelled with the MSS. names *annulatus*, K., *longicornis*, K., and *speciosus* respectively. A normal large ♂ (*speciosus* in Mus. Oxon.) has been dissected for examination of the mouth-parts and genital armature. It is possible that the smaller, darker, and more opaque form, also from Rio de Janeiro, may prove to be distinct? The synonymy quoted refers to the larger insect.

25. *Astylus jatahyensis*.

Astylus jatahyensis, Pic, L'Echange, xvii. p. 35 (1902).

Astylus jatahyensis, var. *armitagei*, Pic, Mélanges exot.-entom. xii. p. 8 (Jan. 1915).

Moderately elongate, rather convex, shining, the elytra duller, clothed with erect, black bristly hairs intermixed with scattered cinereous pubescence, the vestiture of the under surface long, cinereous; black, the antennæ in great part, the prothorax with the entire margin, the elytra with the sutural and outer margins and a narrow !-shaped streak running down the middle of the disc to near the apex, the coxæ, and legs (the tarsi, posterior femora, and posterior tibiæ in part excepted) testaceous; the head closely, the prothorax rather sparsely punctured, the elytra irregularly asperato-punctate, with the interspaces alutaceous. Head rather short and broad, arcuately impressed in front; antennæ moderately long. Prothorax transversely convex, hollowed in the middle at the base, shallowly sulcate posteriorly. Elytra not very long, parallel, with or without two feeble costæ on the disc, the apices narrow, rounded.

♂. Ventral segment 5 feebly arcuato-emarginate, 6 short, triangularly notched at apex. Tegmen truncate at tip. Penis-sheath acuminate.

Var. The elytra testaceous, with two blackish, abbreviated or interrupted streaks, one near the suture, the other submarginal (*var. armitagei*, Pic).

Length $4\frac{1}{2}$ – $5\frac{1}{3}$, breadth 2 – $2\frac{1}{4}$ mm. (σ .)

Hab. BRAZIL, Jatahy in Goyas (*Gounelle*), São Paulo (*ex coll. Fry*).

Pic's type, to judge from the brief note about it, would appear to want the narrow !-shaped streak extending down the disc of each elytron, conspicuous in the two males from Jatahy before me. The variety, represented by two examples from São Paulo in the Fry Collection, agrees with his brief diagnosis of *A. armitagei*.

26. *Astylus vittaticollis*.

Dasytes vittaticollis, Blanch. in Voyage d'Orbigny, p. 98 (1843).

? *Melyris quadriteniata*, Er. Archiv für Naturg. xiii. 1, p. 84 (1847).

σ . Antennæ rather slender, elongate, much longer than in ♀ . Ventral segment 5 deeply arcuato-emarginate, 6 moderately long, subconical, with a narrow, deep, triangular notch at tip. Tegmen with long lateral lobes, which are rounded and clothed with long hairs at the apex. Penis-sheath, as seen in profile, obliquely dilated and subsecuriform at tip.

♀ . Ventral segment 5 feebly emarginate, 6 shaped very much as in σ .

Hab. BOLIVIA (*Mus. Brit.*: σ ♀), Chuquisaca [type]; ? CHILE (*Germain, ex coll. Fry*: σ ♀).

Very like the variable *A. quadrilineatus*, Germ., but with much more finely punctured elytra, the apices without tooth at the sutural angle in either sex; the prothorax (in fresh specimens) with a line down the middle and a space along the sides closely cinereo-pubescent, much as in *A. atromaculatus*, Blanch.; the antennæ long and slender in σ , with the basal joints only testaceous; the genital armature very different.

Five specimens are before me, including a pair from Bolivia, a pair labelled "Chile" (a locality requiring confirmation), and a σ , belonging to the Oxford Museum, labelled "*quadrivittatus*, Chev., Andes." *Melyris quadriteniata*, Er., from Peru, may be based upon a slightly worn example of the present species, the definition "elytris apice integris, crebre punctatis, subrugulosis" agreeing with *A. vittaticollis*.

27. *Astylus quadrilineatus*.

Dasytes quadrilineatus, Germ. Ins. Spec. nov. p. 76 (1825)¹; Blanch. in Voyage d'Orbigny, p. 98²; Cast. Hist. Nat. Col. i. p. 281³.

♂. Antennæ wholly or in part rufo-testaceous, moderately long, considerably longer than in ♀. Elytra more or less sinuate at the tip, and with the sutural angles almost as acute as in ♀. Ventral segment 5 deeply arcuato-emarginate, 6 barely as long as 5, subconical, feebly notched at tip. Tegmen more or less emarginate or bilobed, and clothed with long blackish hairs at apex. Penis-sheath gradually narrowed or acuminate at tip.

♀. Ventral segment 5 feebly emarginate, 6 short.

Hab. BRAZIL^{1,2}, Santa Catharina (*ex coll. Fry*: ♀), Rio Grande; URUGUAY, Maldonado², Monte Video (*C. Darwin*); ARGENTINA (*O. W. Thomas*), Santa Fé and Bahía Blanca (*C. Darwin*), Buenos Ayres³; PATAGONIA².

A variable insect, if the specimens before me all belong to one species. The reddish or flavescent marginal and discoidal vittæ of the elytra are sometimes coalescent at the tip and the discoidal one may be reduced to a narrow incomplete line. Four males have been dissected, showing some variation in the form of the tegmen, which in a large example from Buenos Ayres has a short lobe on each side at tip. Two small males from Monte Video, with the sutural angles of the elytra obtuse and the tegmen rounded at apex, may belong to a different species? The length varies from 6-9 mm. The general colour may be bluish-green, green, nigro-cæruleous, or brassy.

28. *Astylus correptus*, sp. n.

Elongate, moderately broad, shining, nigro-pilose, with short, adpressed, cinereous hairs intermixed; black, the elytra (the humeri, basal portion of the suture, and apical margin excepted) brown; closely, minutely, the elytra finely, irregularly punctate. Head hollowed on each side anteriorly; antennæ strongly serrate, short in ♀, a little longer in ♂. Prothorax broader than long, narrowed anteriorly in both sexes, hollowed in the middle at the base. Elytra long, costate laterally to near the apex, and obsolete bicostate on the disc; in ♂ somewhat rounded at the sides, and with the apical portion narrow and considerably produced; in ♀ subparallel to near the tip, and with the humeri much swollen.

♂. Anterior tarsi with joints 2 and 3 obliquely dentate and 4 angulate, and the intermediate tarsi with joint 3

dentate and 4 angulate at the inner apical angle. Ventral segment 5 arcuato-emarginate, 6 conical. Tegmen flattened, simple, narrow, rounded and entire at the tip. Penis-sheath slender, the outer portion straight, abruptly pointed at the apex.

Length $9\frac{1}{2}$ – $10\frac{1}{2}$, breadth $4\frac{1}{10}$ mm. (σ φ .)

Hab. COLOMBIA [φ] and VENEZUELA [σ] (*Mus. Brit.*).

One pair, acquired by the Museum in 1844, the σ bearing an inapplicable MS. name. The dissimilarity in the shape of the elytra in the two sexes, the elytra themselves being sharply costate laterally in both of them, the peculiarly formed anterior and intermediate tarsi of the σ (suggestive of the Palæartic genus *Henicopus*), and the simple, narrow tegmen in the same sex, are characters of insufficient importance to remove *A. correptus* from *Astylus*. The σ , which must be taken as the type, has the facies of an *Omophlus*.

29. *Astylus forcipatus*, sp. n.

Moderately elongate, narrow, feebly shining, clothed with long, erect, bristly hairs intermixed with adpressed, scattered, cinereous pubescence, the vestiture of the under surface long, cinereous; black, with a faint brassy tinge, the antennæ, tibiæ, and tarsi testaceous; the elytra flavous, each with two broad vittæ extending from the base to the apical declivity (one dorsal, the other submarginal), and a spot before the apex, black; closely, finely, the dark portions of the elytra rugulosely, punctate, the punctures on the flavous portions conspicuous, and uniseriately arranged within the dorsal and marginal ridges. Head broad, the eyes large, prominent; antennæ moderately long. Prothorax transverse, narrowed anteriorly, canaliculate on the disc. Elytra parallel, bicostate, the inner costa stout, the submarginal one narrow, the apices obtuse.

σ . Terminal dorsal segment of abdomen with a long, stout, flattened, slightly sinuate process on each side, which is blunt at the tip and clothed with very long blackish hairs. Ventral segment 5 shallowly arcuato-emarginate, 6 short, deeply, triangularly excised. Tegmen narrow, truncate at the apex. Penis-sheath flattened, acuminate and somewhat spoon-shaped at the tip.

Length $4\frac{1}{2}$ – $5\frac{1}{2}$, breadth $1\frac{2}{3}$ –2 mm.

Hab. BRAZIL (*ex coll. Fry*).

Two males, injured by pinning, and both having the genital armature extruded. A small, narrow, parallel-sided

insect; the elytra flavous, with two broad vittæ (discoïdal and submarginal), and a spot before the apex, black; the antennæ, tibiæ, and tarsi testaceous; the terminal dorsal abdominal segment with a long process on each side. *A. forcipatus* is not unlike the insect here identified as *A. jatahyensis*, Pic, and is somewhat similarly coloured—except that the prothorax is wholly black and the subapical spot on the elytra is testaceous (instead of black)—differing from the latter in having a rougher, less convex prothorax, a stout costa on the disc of the elytra, &c.*

30. *Astylus convexus*, sp. n.

Elongate oval, rather convex, very shining, sparsely pilose; metallic blue, the basal joints of the antennæ in great part rufo-testaceous, the elytra testaceous, with the suture narrowly and two broad stripes on the disc (united posteriorly in one specimen) cæruleous, the legs black; the head closely, finely, the prothorax sparsely, somewhat coarsely, and the elytra very coarsely, punctate. Head rather broad; antennæ (♂) long and comparatively stout, the joints longer than broad, in ♀ a little shorter. Prothorax transverse, ample, rounded at the sides, the margins strongly reflexed. Elytra moderately long, somewhat acuminate at tip, without trace of costæ, the humeri obtuse. Wings wanting. Legs moderately elongate.

♂. Anterior tarsi with joint 2 drawn out into an oblique tooth, and 3 angulate, at the inner apical angle. Ventral segment 5 deeply arcuato-emarginate, 6 short, notched at tip. Penis-sheath drawn out into a long point at apex.

Length 5–5½, breadth 2½ mm. (♂ ♀.)

Hab. PERU, Chanchamayo (*Thamm*).

One male and two females. A rather convex, apterous, metallic-blue insect, with testaceous, cæruleo-bilineate elytra. Not unlike *A. pallipes*, Kirsch, from Ecuador, but more convex, the antennæ longer and stouter, the prothorax more ample and with strongly reflexed margins, the humeral callus obsolete, the legs black, the wings (so far as can be seen without opening the elytra) wanting. This species may have to be removed from *Astylus*. The long antennæ, &c., separate *A. convexus* from the Chilean genus *Arthrobrachus*.

* In the Fry Collection there is a damaged ♂ of an allied larger form from La Paz, Bolivia, with entirely testaceous legs, the abdominal processes wanting, &c. It cannot be referred to *A. boliviensis* or *exclamatoris*, Pic, from the same country.

31. *Astylus curvidens*, sp. n.

Elongate, shining, clothed with long, erect, black, bristly hairs intermixed with scattered adpressed cinereous pubescence, the vestiture of the legs and under surface cinereous; black, the basal joints of the antennæ partly red, the elytra with an oblong streak at the base, the outer margin to near the tip, and two stripes on the disc (one near the suture, abbreviated anteriorly, the other abbreviated behind and placed a little exterior to the basal patch, with which it is sometimes connected anteriorly), the sutural and marginal stripes transversely coalescent just before the apex, flavous or luteous; the head and prothorax densely, finely punctate, the latter with coarser punctures intermixed, the elytra roughly punctured. Head small, subrostrate, the eyes large; antennæ short, serrate, joints 7-10 about as broad as long, in ♂, transverse in ♀. Prothorax narrowed anteriorly. Elytra long, subparallel, costate from the humeral callus to near the apex, and also with an anteriorly evanescent costa on the disc; the apices in ♂ distinctly sinuate and with the sutural angle sharply produced, in ♀ very deeply emarginate, with the sutural and outer angles each produced into a long curved tooth, those at the sutural angles overlapping, the outer one very strongly arcuate.

♂. Metasternum with two compressed, conical, tuberculi-form prominences in the middle behind. Ventral segment 5 deeply arcuato-emarginate, 6 long, subcylindrical (with the dorsal portion forming a long tube, which is cleft laterally at the tip). Tegmen feebly bifurcate at tip, deeply sulcate at the apex above, the apical portion thickly clothed with long, curled, blackish hairs. Penis-sheath sharply pointed, curved upward at the tip.

Length 7-8½, breadth 2½-3 mm. (♂ ♀.)

Hab. VENEZUELA, Merida (Rosenberg: ♂ ♀); ? PERU (ex Deyrolle: ♂).

Three males and four females, the Peruvian habitat requiring confirmation. Extremely like *A. vittatus*, Gorh., from Chiriqui, but easily separable therefrom by the sexual characters: the ♂ with two compressed tubercles on the metasternum and the terminal abdominal segment elongated and subcylindrical; the ♀ with a very long tooth on each side of the apical emargination, the outer tooth arcuate, the inner one overlapping the corresponding tooth on the opposite elytron.

32. *Astylus antillarum*.

Astylus antillarum, Gorh. P. Z. S. 1898, p. 328, t. 27, fig. 7 (♂).

♂. Metasternum with two, curved, outwardly-directed, dentiform processes arising from a tumid space in the middle behind. Ventral segment 5 deeply arcuato-emarginate, 6 long, compressed (subcylindrical as seen in profile with the terminal dorsal segment).

Hab. ANTILLES, St. Vincent.

Described from a single pair—the ♂ now in the British Museum, the ♀ having passed into Pic's collection, from that of Gorham. The ♀ has the apices of the elytra deeply excised, as in the same sex of the allied forms. The spots are too red in the published figure.

33. *Astylus gorhami*.

♂. *Astylus gorhami*, Pic, Mélanges exot.-entom. xii. p. 8 (Jan. 1915).

Elongate, moderately shining, clothed with long, erect, black bristly hairs intermixed with scattered fine, adpressed, cinereous pubescence, the latter somewhat conspicuous along the elytral suture in ♀, the vestiture of the legs and under surface long, cinereous; black, the antennal joints more or less rufescent externally or at their base, the elytra each with a pyriform patch on the disc at the base, a mesially-constricted, apically widened, elongate streak on the disc below this, a subquadrate patch near the tip, and the outer margin in great part, orange-yellow; the head and prothorax densely, finely punctate, the latter with coarser, punctures intermixed, the elytra roughly punctured, smoother in the depressed juxta-sutural area in ♀. Head long, narrow, subrostrate; antennæ short, joints 7-10 transverse in ♀. Prothorax about as long as broad, narrowed anteriorly. Elytra long, sharply margined, costate laterally from the humeral callus to the common transverse apical depression, and with a faint costa on the disc also, the space between this and the suture and another within the outer ridge longitudinally depressed, conspicuously so in ♀; the apices blunt or subtruncate in ♂, and deeply semicircularly excavate (the sutural and outer angles thus appearing sharply dentate) in ♀.

♂. Metasternum with two compressed, curved, outwardly directed dentiform processes arising from a tumid space in the middle behind. Ventral segment 5 as long as 3 and 4

united, very deeply emarginate, 6 long, compressed. Tegmen slightly dilated and simply bifurcate at the tip, the apex set with numerous long, projecting, blackish hairs. Penis-sheath acuminate, curved upward at tip.

♀. Ventral segment 5 triangularly emarginate at tip, 6 short.

Length $7\frac{1}{2}$ -8, breadth $3-3\frac{1}{2}$ mm. (♂ ♀.)

Hab. ANTILLES, St. Vincent (*H. H. Smith, Lansdown Guilding*), and Union Island in the Grenadines (*H. H. Smith*).

Redescribed from five males and four females belonging to the British Museum or to the Hope Collection at Oxford, including a ♂ from St. Vincent found by Lansdown Guilding and a ♀ from Union Island, the others unlabelled, but all probably from St. Vincent. The specimen from the Grenadines, labelled *A. antillarum*, var.?, by Gorham, was not mentioned by him in his description of that species. It is strange that there should be two such closely allied forms in a small island like St. Vincent, but there is nothing intermediate in the series of *A. gorhami* before me, *A. antillarum* having the elytra spotted much as in *A. octopustulatus*. The emarginate, bidentate apices of the elytra is a character peculiar to the ♀ of these three insects, all of which have a bituberculate metasternum in ♂.

34. *Astylus amabilis*.

♀ *Astylus amabilis*, Pic, L'Echange, xvii. p. 35 (1902).

Elongate, shining, clothed with long, erect, black bristly hairs intermixed with scattered adpressed cinereous pubescence, the vestiture of the legs and under surface cinereous; black, the basal joints of the antennæ partly or almost entirely red, the elytra with a broad or moderately broad stripe extending down the disc to the apical depression, a transverse subapical patch, and the outer margin to near the apex, these markings sometimes coalescent posteriorly, flavous or orange-yellow; the head and prothorax closely, finely, the elytra roughly, punctured. Head small; antennæ short. Prothorax narrowed anteriorly. Elytra long, subparallel, costate laterally from the humeral callus, and with an indication of a faint costa on the disc; the apices in ♂ feebly subtruncate or rounded, in ♀ deeply emarginate, with the sutural angle drawn out into a long, narrow, nearly straight tooth and the outer angle into a shorter acutely

triangular one, the sutural tooth slightly overlapping the one on the opposite elytron.

♂. Metasternum with two compressed conical tubercles in the middle behind. Ventral segment 5 deeply arcuato-emarginate, 6 elongate, compressed.

Length $6\frac{1}{2}$ -8, breadth $2\frac{1}{2}$ - $3\frac{1}{5}$ mm. (♂ ♀.)

Hab. COLOMBIA (*ex coll. Fry*), Magdalena (*Mus. Brit.*).

A mainland form of the Antillean *A. gorhami*, Pic, the markings on the disc of the elytra united into an almost straight vitta, the tooth at the sutural angle in the ♀ elongated and longer than the outer one, which is also more acute. Three males and two females seen, one female bearing the MS. name *Dasytes spinosus*, Guér., and one male, ex Deyrolle, labelled *D. amabilis*, Dej. The apices of the elytra are truncate in two of the males and rounded in the third. This insect seems to be referable to the species briefly alluded to by Pic under the name *A. amabilis*: he describes the elytra as having a complete pale discal band and a narrow black tip. His type, from Colombia, was also obtained from Deyrolle, and under the same MS. name.

35. *Astylus octopustulatus*.

Astylus octopustulatus, Gorh. Biol. Centr.-Am., Coleopt. iii. 1, p. 330, t. 12. fig. 25 (♂).

♂. Elytra truncate at apex. Metasternum with the small dentiform processes arising from a tumid space in the middle behind. Ventral segment 5 very deeply emarginate, 6 long, compressed. Tegmen simply bifurcate and clothed with long, projecting, blackish hairs at tip. Penis-sheath drawn out into a long point at the apex.

♀. Elytra deeply emarginate at apex, the sutural and outer angles sharply dentate.

Hab. PANAMA, Chiriqui.

Gorham correctly identified the sexes of this insect, but he overlooked the metasternal dentiform prominences of the ♂, which are wanting in the same sex of his *A. vittatus*.

36. *Astylus lebasii*, sp. n.

Dasytes lebasii, Dej. Cat. 3rd edit. p. 124 (1837).

Elongate, narrow, shining, clothed with long, erect, black, bristly hairs intermixed with scattered adpressed cinereous pubescence, the vestiture of the legs and under surface

cinereous; black, the basal joints of the antennæ red, the elytra each with four longitudinally arranged spots on the disc—one at the base, acuminate-oval, one, oblong or slightly oblique, one, rounded or subtriangular, and one, transverse, subapical, the anterior two sometimes coalescent—and the outer margin to near the apex, flavous or orange-yellow; the head and prothorax closely, finely, the elytra roughly, punctured. Head small, the eyes rather large; antennæ short. Prothorax narrowed anteriorly. Elytra long, subparallel, sharply costate from the humeral callus downward, and also feebly costate on the disc; the apices in ♂ feebly truncate or rounded, in ♀ more or less emarginate, and with the sutural and outer angles dentiform.

♂. Metasternum with two small, compressed, subcontiguous tubercles in the middle behind. Ventral segment 5 deeply arcuato-emarginate, 6 long, compressed. Tegmen simply bifurcate and clothed with long, projecting blackish hairs at the tip. Penis-sheath drawn out into a long, slender point at the apex.

Length $5\frac{1}{4}$ –6, breadth $2\frac{1}{10}$ – $2\frac{1}{2}$ mm. (♂ ♀.)

Hab. COLOMBIA (*Mus. Brit.*), Carthagena (*Dejean Cat.*); VENEZUELA (*ex coll. Fry*).

Described from eight examples, four of each sex. The teeth at the apex of the elytra in ♀ vary in length, and the first and second spots on the disc are confluent in two of the specimens of that sex before me. This is the undescribed smaller Colombian form alluded to by Gorham in his description of *A. octopustulatus*. There is nothing intermediate in the long series of the latter examined, and the present insect may be distinguished from it by the elongated first and second spots on the disc of the elytra, approaching *A. gorhami* in this respect. The genital armature is very similar. *A. lebasi* is not mentioned by Pic in any of his various scattered papers on *Astylus*.

37. *Astylus hamatilis*, sp. n.

Elongate, narrow, shining, clothed with erect, black, bristly hairs intermixed with scattered fine adpressed cinereous pubescence, which is denser on the prothorax and elytral suture of ♀, the vestiture of the legs and under surface cinereous; black, the basal joints of the antennæ partly red, the elytra each with four longitudinally-arranged marks on the disc—one, pyriform, at the base, one, angulate or Λ -shaped, one, rounded or subtriangular (connected out-

wardly in one specimen with the angular mark), and one, transverse, subapical—and the outer margin to near the apex, orange-yellow, the head and prothorax closely, finely punctate, the latter with coarser punctures intermixed, the elytra roughly punctured. Head narrow; antennæ short, joints 7–10 transverse in ♀. Prothorax narrowed anteriorly. Elytra long, subparallel, costate laterally from the humeral callus to the apical declivity, and with an anteriorly evanescent costa on the disc; the apices narrow and rounded or subtruncate in ♂, a little wider, feebly emarginate, and with the sutural angle angularly dilated inwards so as to overlap the one on the opposite elytron, in ♀.

♂. Metasternum with two compressed conical tubercles in the middle behind. Ventral segment 5 deeply arcuato-emarginate, 6 long, compressed (subcylindrical as seen in profile with the terminal dorsal segment). Tegmen narrow, subtruncate at tip, which is slightly hollowed dorsally and clothed with long blackish hairs. Penis-sheath drawn out into a slender, feebly curved point.

Length $6\frac{1}{4}$ – $6\frac{1}{2}$, breadth $2\frac{1}{3}$ – $2\frac{3}{4}$ mm. (♂ ♀.)

Hab. VENEZUELA (*ex coll. Fry*).

Three males and one female, varying a little in the development of the elytral markings, two of them being coalescent in one specimen. Near *A. octopustulatus*, Gorh., the spots differently shaped, the second one on each elytron hooked, the tooth at the outer angle in the ♀ reduced to a feeble angulation, the dentiform sutural angle directed inwards and overlapping the one on the opposite wing-case.

38. *Astylus imbricatus*, sp. n.

♀. Black, the elytra with three rather broad flavous vittæ, the two on the disc connected anteriorly, the sutural and marginal ones broadly coalescent before the tip (leaving the apical margin narrowly black), and the median one slightly constricted posteriorly; the apices of the elytra sinuato-truncate, the sutural angle sharp and overlapping the one on the opposite wing-case; the elytral bicostate and rather coarsely punctate.

Length $5\frac{1}{2}$, breadth 2 mm.

Hab. VENEZUELA (*ex coll. Fry*).

One female. Smaller and narrower than the smallest example of *A. vittatus*, var. *chiriquensis*, the apices of the elytra truncate, with inwardly produced, acute, overlapping

sutural angles. The male probably has tubercles on the metasternum, these being present in the same sex of the nearly allied *A. curvidens*. The Venezuelan insect referred by Gorham to his *A. vittatus* may belong here?

39. *Astylus laticauda*, sp. n.

♀. Black, the elytra with an oblong spot at the base, a small spot on the disc at about one-third from the tip, a transverse patch midway between the latter and the apical margin, and the outer margin to about the middle, orange-yellow; the elytra bicostate, the apices broadly sinuato-truncate, with the sutural angle produced inwardly into a rather long tooth and the outer angle rounded; the other characters as in the same sex of *A. gorhami*, *A. antillarum*, *lebasi*, &c.

Length 7, breadth 3 mm.

Hab. VENEZUELA (*ex coll. Fry*).

One worn female, too different to be included under any of the allied forms as a colour-variety (the third spot on the elytra small and the second wanting altogether), owing to the broadly sinuato-truncate apices of the elytra and the inwardly-produced dentiform sutural angles.

Alphabetical list of species and varieties of *Astylus* enumerated in the present paper: the synonyms and varietal names are printed in italics, and the numbers of the species are placed in brackets after their respective names, an asterisk indicating the new forms:—

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| <i>affinis</i> (2). | <i>cyanerythrus</i> , 24. |
| <i>amabilis</i> , 34. | <i>12-maculatus</i> (19). |
| <i>annulatus</i> (24). | <i>fasciatus</i> (5). |
| <i>antillarum</i> , 32. | <i>fenestratus</i> (7). |
| <i>antis</i> , 5. | <i>flavofasciatus</i> (5). |
| <i>armitagei</i> (25). | * <i>forcipatus</i> , 29. |
| <i>atromaculatus</i> , 19. | <i>gayi</i> , 2. |
| <i>aulicus</i> , 7. | <i>gorhami</i> , 33. |
| <i>bifasciatus</i> (24). | * <i>haematostictus</i> , 4. |
| <i>bisse-guttatus</i> (12). | * <i>hamatilis</i> , 37. |
| <i>bonplandi</i> , 9. | * <i>imbricatus</i> , 38. |
| <i>bourgeoisii</i> , 12. | <i>intermedius</i> (1). |
| * <i>caeruleotinctus</i> , 10. | <i>jatahyensis</i> , 25. |
| <i>chiriquensis</i> (21). | * <i>laticauda</i> , 39. |
| * <i>convexus</i> , 30. | * <i>lebasi</i> , 36. |
| * <i>correptus</i> , 28. | <i>lineatus</i> , 20. |
| * <i>curvidens</i> , 31. | <i>longicornis</i> (24). |

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| *luteicauda, 17. | <i>rubripennis</i> (9). |
| *luteoguttatus, 16. | <i>rubrofasciatus</i> (24). |
| <i>nigricollis</i> (19). | <i>rugosus</i> (1). |
| *nigrolimbatus, 11. | sexguttatus, 15. |
| <i>notatus</i> (18). | sexmaculatus, 3. |
| octopustulatus, 35. | *sempustulatus, 14. |
| pallipes, 22. | <i>speciosus</i> (24). |
| <i>pictus</i> (3). | <i>spinosus</i> (34). |
| <i>porrectus</i> (2). | splendidus, 6. |
| quadrilineatus, 27. | subgriseus, 23. |
| <i>quadrifenestratus</i> (26). | trifasciatus, 1. |
| <i>quadrivittatus</i> (26). | variegatus, 18. |
| <i>revoili</i> (18). | vittaticollis, 26. |
| riveti, 13. | vittatus, 21. |
| rubripennis, 8. | |

Horsell, Aug. 1918.

XXXIII.—On some External Characters of Ruminant Artiodactyla.—Part IV. The Reduncinæ (Cervicaprinæ) and Æpycerinæ. By R. I. Pocock, F.R.S.

As in the previous papers of this series published in the 'Annals' for June, August, and September of this year, the pagination subjoined to the specific headings refers to my treatise on the Cutaneous Glands of the Ruminants printed in the Proc. Zool. Soc. for 1910.

Subfamily REDUNCINÆ (olim Cervicaprinæ).

Genus PELEA.

Pelea capreolus, Bechst. (p. 911).

A second specimen of this species, which came into my hands since 1910, enables me to confirm in every particular the characters of the genus, based on external features, which I pointed out in that year.

Since this specimen, like the first, had no trace of inguinal glands, I think it may be assumed that Owen's statement as to their presence was false.

The only fact I have to add to my original description is that the false hoofs on both the fore and hind feet are united across the middle line.

Genus ELEOTRAGUS, Gray.

Eleotragus arundinum, Bodd.

In 1910 I was not in a position to incorporate an account